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September 26, 2016

BEFORE THE ARIZONA CORPORATION COMMISSION

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IN THE MATTER OF THE APPLICATION OF TRICO  
ELECTRIC COOPERATIVE, INC., AN ARIZONA  
NONPROFIT CORPORATION, FOR A DETERMINATION  
OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT  
AND PROPERTY AND FOR INCREASES IN ITS RATES  
AND CHARGES FOR UTILITY SERVICE AND FOR  
RELATED APPROVALS.

DOCKET NO. E-01461A-15-0363

Brief of Robert B. Hall

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Introduction

This brief addresses the need to:

- 1) Eliminate “Lost Fixed Costs” as a tool for rate setting.
- 2) Replace it with Bottom Line Accounting.
- 3) Eliminate Net Metering.
- 4) Replace it with Net Billing.

These steps will result in a rate setting process, and the subsequently-determined rate schedules, that is fair and transparent to all TRICO members.

## Available Data for Fair and Transparent Rate Setting

TRICO, with ongoing cooperation from the ACC Staff, has completed a comprehensive analysis of the costs relating to the delivery of electricity to its members. The centerpiece of the analysis is found in Schedule G-6.0 that provides the costs at each step in the process from acquiring fuel to generate electricity through the generation and transmission and final distribution of electricity to TRICO members.<sup>1</sup> These analyses provide the starting point for developing a rational charge rate for TRICO's product: kWhs.

### Fixed Costs and Fixed Charges

Table 1 indicates the cost and charge elements that can readily be used to arrive at a billing rate leading to the revenue requirements indicated by TRICO in their rate application.

Table 1	
Costs	Charges
Fixed	Direct Fixed Indirect Fixed Volumetric Rate
Variable	Volumetric Rate

Following is a brief description of the *Cost* and *Charge* elements presented in Table 1:

*Fixed Costs* are related to those expenses incurred by an electric utility regarding loans associated with capital expenditures, buildings, service equipment, labor, billing services, etc., and would be ongoing even if the utility sold no electricity.

The *Variable Cost* (in \$/kWh) is related to the cost of the fuel (coal, natural gas) necessary to generate a kWh of electricity. It is sometimes referred to as the *Avoided Cost Rate* (in \$/kWh).

*Fixed Charges* are charges that appear on the members' monthly bill and do not change from month to month. *Fixed Charges* may or may not be correlated to *Fixed Costs*.

*Fixed Charges* can be *direct* or *indirect*. A *Direct Fixed (service) Charge* is levied to cover a *Fixed Cost* that can be specifically assigned to (and is only used by) every individual customer. Traditionally, line hook-up to the residential member, meter, meter reading and billing are fairly employed as *Direct Fixed Charges*.

An *Indirect Fixed Charge* can be levied to cover some portion, or all, of the *Fixed Costs* not covered by the *Direct Fixed Charge*. The present TRICO-proposed \$9.00 increase of the *Basic Service Charge* from \$15.00 to \$24.00 per month would be such a charge because it is related to equipment and facilities shared by multiple members.

In order to meet the Required Annual Revenue target, the *Volumetric Rate* is chosen to cover the *Avoided Cost Rate* plus those *Fixed Costs* not covered by the previously defined *Direct* (and possibly *Indirect*) *Fixed Charges*.

<sup>1</sup> Docket #E-01461A-15-0363, TRICO Application (October 23, 2015) – Volume 2 of 2 – Schedule G-6.0

It is noted that there is no magic formula for how to allocate the *Charge Elements* described in Table 1. All that is required is that the quantitative values assigned to each of the *Charge Categories* be chosen to ensure that the Required Annual Revenue number (in \$/year) can be achieved.

### Simplified Bill-Rate Setting

The cost analysis prepared by TRICO as presented in Schedule G-6.0 of their rate case filing provides all the necessary data required to evaluate any number of billing rate scenarios for the Residential Class of TRICO's members. Table 2 summarizes the required salient data numbers that are employed to design these scenarios.

Table 2	
The Data for Annual Required Revenue and kWh-Production and Number of Members in Residential Class were taken from Schedule G-6.0, page 1 of 8:	
Required Annual Revenue (\$/yr.)	\$57,394,762
Required Annual kWh Production (kWh/yr.)	379,931,171-kWh
Average Number of Residential Members (#)	37,838
The <i>calculated</i> numbers, using the above data, to determine billing charges that will lead to the desired Annual Revenue target, are:	
Average Residential Monthly Bill (\$/mo.)	\$126.41
Average Residential Monthly Consumption (kWh/mo.)	837-kWh

Table 3 uses the Table 2 *calculated* numbers to illustrate four different billing rate scenarios. In Case 1 there is no Basic Fixed Charge and the resulting "necessary" volumetric rate is \$0.1511/kWh. In this scenario if a customer did not use any electricity in a given billing month, their bill would be for \$0.00. On the other hand, in Case 4 all the Fixed Costs (\$100.64/mo.) are charged each month and the "necessary" volumetric rate is \$0.0308/kWh. In this scenario if a customer did not use any electricity in a given month, their bill would still be \$100.64.

Table 3				
This Table indicates the required volumetric rate (in \$/kWh) that, given a monthly Fixed Charge rate (in \$/mo.), is necessary to ensure that the Average Residential Monthly Bill is \$126.41/month.				
Case	Description	Fixed Costs (\$/mo.) <i>Note [1]</i>	Fixed Charge (\$/month)	Necessary Volumetric Rate (\$/kWh)
1	No Fixed Costs covered by a fixed charge.	\$100.64	\$0.00	\$0.1511/kWh
2	Some Fixed Costs covered by a fixed charge ("Basic Service Charge").	\$100.64	\$15.00	\$0.1331/kWh
3	Additional Fixed Costs covered by a fixed charge ("Basic Service Charge").	\$100.64	\$24.00	\$0.1224/kWh
4	All Fixed Costs covered by fixed charge.	\$100.64	\$100.64	\$0.0308/kWh
<b>Note [1]</b> Fixed Costs per month per member inferred from data provided in Schedule G-6.0				

Case 2 in Table 3 describes the present TRICO Basic Service Charge (\$15.00/mo.), resulting in a "necessary" volumetric rate of \$0.1331/kWh. Case 3 describes the TRICO proposed Basic Service Charge (\$24.00/mo) leading to a "necessary" volumetric rate of \$0.1224/kWh.

Again, the important takeaway from Table 3 is that there are several viable rate design alternatives that will lead to the achievement of the required annual revenue stream.

### Fixed Costs - Loss and Recovery

TRICO has taken the position that, in the situation where a *basic fixed service charge* is in place, members that consume less than 837-kWh/month (the average residential monthly consumption) are not paying their fair share of Fixed Costs, leading to "Lost Fixed Costs" that somehow need to be "Recovered". A mechanism for "Lost Fixed Cost Recovery" is conveniently provided by a mathematical construct. Members who consume more than 837-kWh/month (the average) are covering more than their share of the monthly Fixed Costs, and as a consequence of how mathematical averaging works out, they provide the necessary revenue to recover the Fixed Costs that are "lost" as a consequence of those who have consumed less than the monthly average. It is further held that this mathematical construct results in the higher consuming members (consumption greater than 837-kWh/month) "subsidizing" the lower consuming members. Referring to the Bill Frequency Analysis data, it is inferred that 64% of TRICO members are, according to TRICO, effectively receiving a "subsidy" from the high kWh-consuming members.<sup>2</sup> The dictionary defines subsidy as a "grant or gift of money".<sup>3</sup> For those 64% of TRICO members whose means or lifestyle result in them consuming less than the average amount of electricity consumed by all members, it is likely that the label of being "subsidized" is not appreciated, and certainly not fair or appropriate.

### Lost Fixed Costs - Recovery Mechanisms

Table 4 summarizes several types of "Lost Fixed Costs" that TRICO is trying to recover. The first type of "Lost Fixed Cost" has been discussed above. The second column indicates that this particular "Lost Fixed Cost" can be measured directly based on data provided by the standard kWh-measuring meter located at each TRICO residential member's site. As previously discussed, the mechanism of "Lost Fixed Cost" Recovery is provided by a mathematical construct that leads to full recovery of "Lost Fixed Costs". However, according to TRICO, members who consume more than the 837-kWh/month average are subsidizing those members who consume less than 837-kWh/mo.

The second type of "Lost Fixed Cost" indicated in Table 4 involves the acquisition and use by members of energy efficient devices, for example, CFL and LED lighting. Across the nation, electricity consumption for residential lighting is about 10% of total consumption. Full conversion of residential lighting to CFLs and LEDs will reduce the contribution of that consumption to total residential consumption to just 2%. However, there is no way presently to measure the "savings" that customers realize and, consequently, the "Fixed Costs" that TRICO "loses". However, it is held that, even though this "loss" cannot be measured, the net effect is that all other members are "subsidizing" those who have acquired energy efficient lighting devices.

<sup>2</sup> Docket #E-01461A-15-0363, TRICO Application (October 23, 2015) – Volume 2 of 2 – Schedule H-5.0

<sup>3</sup> Webster's Ninth New Collegiate Dictionary, 1989.

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<b>Table 4</b>				
This table describes three specific types of "Lost Fixed Costs" and indicates whether these "losses" are measurable, recoverable and if they lead to subsidies between members.				
<b>Type of "Lost Fixed Cost"</b>	<b>Are "Lost Fixed Costs" Measurable?</b>	<b>"Lost Fixed Costs" Recovery Mechanism</b>	<b>Are "lost Fixed Costs" fully Recovered?</b>	<b>Type of subsidy.</b>
Members consuming <b>less</b> than average (837-kWh/month)	Yes, using standard meters at residential site	Members consuming <b>more</b> than average (837-kWh/month)	Yes	Members consuming more than 837-kWh/mo. subsidizing members consuming less than 837-kWhs/mo.
Residential CFL and LED lighting  (Energy Conservation)	No  (see <b>Note [1]</b> below)	(see <b>Note [2]</b> below)	?????	All other members subsidizing members using energy efficient devices
Residential PVDG	Yes, using TRICO installed meters to measure solar output of PVDG site	(see <b>Note [2]</b> below)  (see <b>Note [3]</b> below)	?????	All other members subsidizing members with PVDG arrays
<p><b>Note [1]:</b> Nationwide, 10% of residential usage is for lighting; full conversion to CFL and LED lighting will reduce that to 2%.</p> <p><b>Note [2]:</b> A Lost Fixed Cost Recovery (LFCR) charge has been approved in certain cases by the ACC to partially offset revenue losses when customers reduce their bills through conservation or renewable energy programs.</p> <p><b>Note [3]:</b> Is it intended and, more to the point, is it fair to employ ACC approved REST funds to recover Lost Fixed Costs?"</p>				

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4 The final type of "Lost Fixed Cost" shown in Table 4 is related to residential PV distributed generation  
5 (PVDG). In contrast to energy efficient CFL and LED lighting, "Lost Fixed Costs" associated with PVDG can be  
6 measured using TRICO-installed meters located at the PVDG site to measure the solar output of the  
7 residential PVDG array. However, there is no related recovery mechanism. And, it is held that even though  
8 this "loss" can be measured, and since there is no viable recovery mechanism, all other members are  
9 "subsidizing" those who have acquired PVDG systems.

10  
11 It is noted that the TRICO-installed meter to measure the solar output of the residential PVDG site,  
12 presumably to identify "Lost Fixed Costs", is not paid for directly by the PVDG owner. In contrast, the bi-  
13 directional meter installed to measure electricity delivered by TRICO to the PVDG site, and vice-versa, is paid  
14 for by the residential PCDG site member using a \$3.38/month surcharge, an example of a legitimate *direct*  
15 *charge* covering a *fixed cost*.

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## The Fallacy of "Lost Fixed Costs"

The reality is that Fixed Costs are not "lost". The amount of Fixed Costs taken on by a utility is only *indirectly* related to how many kWhs are sold. Yet, these costs must be covered. The real quantity that may be "lost" due to technology developments is the amount of kWh "sales", or correspondingly, the revenue that those sales generate. By the authority of the ACC, a utility is "guaranteed" that its revenues meet its expenses, covering both variable and fixed costs, as well as a specified investment return for IOUs and retired capital credits for Cooperatives. Chasing down the so-called "Lost Fixed Costs" creates a convoluted accounting system that is not particularly transparent, and results in the designation of large numbers of members/customers as being subsidized, clearly an artifact that is not justified and is unfair.

## Beyond "Lost Fixed Costs" Accounting – Bottom Line Accounting

The simplified Bottom Line Accounting method <sup>4</sup> utilizes the cost analysis data provided in TRICO's Schedule G-5.0 included in their rate case submission.<sup>5</sup> This simplified and transparent method combines a simple monthly *Basic Service Charge* based on covering *Direct Fixed Costs* and achieves the required annual revenues with the appropriate volumetric (in \$/kWh) charge rate, thus eliminating the need for "subsidies" to recover "Lost Fixed Costs".

**Appendix I** describes the billing determinants which are derived from Schedule G-6.0 and are the unbundled costs for the adjusted test year ending December 31, 2014. The two major column groupings are the *cost items* and *cost type*. *Cost items*, are related to the generation, transmission and distribution of electricity, and customer costs.

*Cost type*, indicates whether the cost is *variable* or *fixed*. *Variable* operating costs (in \$/kWh) are related to the cost of the fuel (coal, natural gas) necessary to generate a kWh of electricity.

As previously indicated, *Fixed Charges* can be *direct* or *indirect*. A *direct* service charge is levied to cover a *Fixed Cost* that can be specifically assigned to (and is only used by) every individual customer.

The *fixed costs* (in \$/kWh) for Customer Service depicted in the shaded area of **Appendix I** can justifiably be covered by a monthly *fixed charge*, and subsequently be converted to a Basic Service Charge as illustrated. In this case the Basic Service Charge is \$14.62/month, close to the \$15.00/month charge that has been applied to TRICO member bills over the last several years.

<sup>4</sup> Docket #E-01461A-15-0363, R. B. Hall Testimony, May 18, 2016, pages 6-8. (RBH Exhibit #1 in 8/17/2016 Hearing Docket Record).

<sup>5</sup> Docket #E-01461A-15-0363, TRICO Application (October 23, 2015) – Volume 2 of 2 – Schedule G-6.0

## Beyond Net Metering – Net Billing

The implementation of the *Net Billing* method utilizes the data, provided in Schedule G-6.0 (pages 3, 5 and 7 of 8), that track the annual cost at each step along the way from the delivery of fuel (coal, natural gas or sunlight) through electricity generation, then subsequent transmission and distribution. A summary of these data is provided in **Appendix I**. Using this methodology, alternative electricity generators are compensated for their delivery of electricity based on what parts of the total delivery system they are displacing: for utility scale solar, only the *variable* generation charge; for DG, all generation and transmission charges.

Accordingly, referring to **Appendix I**, PVDG members receive \$0.082095/kWh for the solar-generated electricity they *export* to TRICO as a consequence of the parts of the total delivery system (generation/transmission) that they are displacing. Concurrently, TRICO is effectively receiving \$0.051495/kWh from the PVDG exporter based on the use by the PVDG exporter of the distribution network provided by TRICO.

In the *Net Billing* accounting method, the *imported electricity cost rate* (\$0.1334/kWh) is the same one that applies to all non-DG residential customers. It is important to note that a residential DG array site, designed to produce the annual total consumption of electricity for that site, typically provides 70% of that site's solar-generated electricity to the utility (and correspondingly, purchases 70% of the electricity it consumes on an annual basis *from* that utility). Accordingly, with the *net billing* the DG customer is paying the same fee rate, like all other non-solar residential customers, on 70% of what the customer annually consumed before having the residential PV solar array.

*Net billing* leads to fair pricing of electricity *imported* and *exported* by PVDG members, wherein TRICO is being compensated for the use by the PVDG member for *export* of its solar-generated electricity using the TRICO distribution network. Although this compensation to TRICO will apply to residential solar PV systems interconnected after May 31, 2016, it will be continue to be absent for residential PV systems interconnected before June 1, 2016. In this latter case, TRICO is losing revenues since it is not being compensated for the use of its distribution network as a consequence of net metering. Effectively, the owners of these systems interconnected before June 1, 2016 are being subsidized by all other members for this revenue "loss".

## Recommendations

The following are recommended:

- 1) Use the existing cost analysis data (Schedule G-6.0) and Bottom Line Accounting to determine bill charging rates based on a \$15.00/month Basic Service Charge plus the volumetric charge rate, \$0.1334/kWh, to generate the required annual revenues.
- 2) Eliminate the use of "Lost Fixed Costs" as a factor in the rate setting process. Its use is confusing and leads to the identification of customer subsidies where none, in fact, exist.
- 3) Eliminate Net Metering.
- 4) Utilize the existing cost analysis data (Schedule G-6.0) and Net Billing to determine a fair rate for electricity exported by the PVDG member to TRICO (\$0.0821/kWh) for residential solar PV systems interconnected after May 31, 2016.

## Appendix I

Data Derived from Schedule G-6.0 - pages 3,5 and 7 of 8

Cost Item	Cost Type		Total (\$/kWh)	Accumul.
	Variable (\$/kWh)	Fixed (\$/kWh)		Total (\$/kWh)
<b>Generation/Transmission (GT)</b>				
PP Generation - Energy	0.030795			
PP Demand Generation		0.036561		
PP Demand Delivery		0.012926		
Transmission		0.001813		
			for GT	
Total	0.030795	0.051300	0.082095	0.082095
<b>Distribution (Dist.)</b>				
Dist. Subs.		0.007271		
Dist. Backbone.		0.011686		
Dist. Demand		0.011980		
Dist. Customer		0.020558		
			for Dist.	
Total		0.051495	0.051495	0.13359
			Direct Fixed Charge (\$/kWh)	
<b>Customer Costs (CC)</b>				
Metering		0.006252	0.006252	
Meter Reading		0.001170	0.001170	
Cust. Records		0.007560	0.007560	
Cust. Service		0.001516	0.001516	
Revenue		0.000979	0.000979	
			for CC	
Total		0.017477	0.017477	0.15107

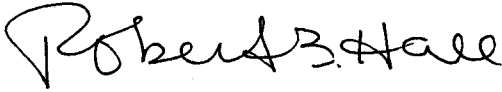
Calculation of monthly Customer Service Charge**INPUTS**

Total Residential Annual Consumption (kWh/yr)	379,931,171
Number of Residential Customers	37,838
Months per Year	12
Effective Volumetric Rate for Customer Charge (\$/kWh)	0.017477

**OUTPUT**

Monthly Customer Service Charge (\$/month)	\$14.62
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1  
2 RESPECTFULLY SUBMITTED this 26th day of September 2016,

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